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(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

38

Application Number

10/698,158

Filing Date

October 31, 2003

First Named Inventor

Jeffrey D. Carnevali

Art Unit

3632

Examiner Name

Amy Jo Sterling

Attorney Docket Number

NPI-019

ENCLOSURES (Check all that apply)

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Charles J. Rupnick (Reg. No.: 43,068)

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September 8, 2007

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No. : 10/698,158
Inventor(s) : Jeffrey D. Carnevali
Filed : October 31, 2003
TC/A.U. : 3632
examiner : Amy Jo Sterling

Confirmation No.: 9849

Docket No. : NPI-019
Customer No. : 24,692

AMENDED APPEAL BRIEF

Mail Stop: Appeal Brief-Patents
Commissioner for Patents
Board of Patent Appeals and Interferences
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Alexandria, VA 22313-1450

Sir:

The instant Substitute Appeal Brief is being filed within one (1) month of the Notification of Non-Compliant Appeal Brief mailed August 14, 2007.

Pursuant to the Notice of Appeal mailed May 12, 2007, and within two (2) months of the Office date of receipt of May 14, 2007, please enter the following Appeal Brief:

(i) REAL PARTY IN INTEREST

The real party in interest is Jeffrey D. Carnevali, a US citizen residing at 5957 Beach Drive
5 SW, Seattle, County of King, State of Washington, 98136, sole inventor and owner of the entire
interest of the above captioned application.

(ii) RELATED APPEALS AND INTERFERENCES

No other prior and pending appeals, interferences or judicial proceedings are known to
either appellant or the appellant's legal representative which may be related to, will directly affect
10 or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(iii) STATUS OF CLAIMS

Claims 1-3 and 5-21 are pending and stand rejected.

Claims 1-3 and 5-21 are appealed.

(iv) STATUS OF AMENDMENTS

15 The status of the amendment filed subsequent to non-final rejection is that the amendment
has been entered. No amendment was filed subsequent to final rejection.

The Applicant has incorporated said amendment in the Appendix of Claims attached
hereto.

(v) SUMMARY OF SUBJECT MATTER

20 In the invention as presently claimed, a flexible support apparatus (10) having a support
base (14), a mounting bracket (16), and a permanently bendable continuously solid metal rod (12)
is disclosed. The claims of the present invention are to a flexible support apparatus and methods in
permanently bendable continuously solid metal rods (12) that are fused directly with weld joints to
the support base (14) and mounting bracket (16). Such direct fusing has benefits in cost
25 advantages, reliability and permanence. Preferably, opposite ends (12a) of the metal rod (12) are
sized to be received in openings (36, 36') in the support base (14) and mounting bracket (38) and
fused thereto by ultrasonically welding. Figs. 2 and 5 illustrate various embodiments of the

method. See, e.g., Detailed Description Of Preferred Embodiment at page 6, line 15-page 8, line 4; page 9, line 25-page 10, line 15; Figures 2, 5.

5 The metal rods (12) of the present invention are solid metal rods formed of a substantially round elongated shape. See, e.g., Detailed Description Of Preferred Embodiment at page 6, lines 19-25; Figures 2, 3.

In particular, the solid metal rods (12) are formed of a material selected from the group of materials comprising: aluminum, copper, and copper coated with another metal material. See, e.g., Detailed Description Of Preferred Embodiment at page 6, lines 15-25.

10 A knurled or otherwise upset feature of the opposite ends (12a) of the smooth metal rod (12) aids in fusing by ultrasonic welding when the support base (14) and mounting bracket (16) are formed of a plastic material amenable to ultrasonic welding. See, e.g., Detailed Description Of Preferred Embodiment at page 7, line 14-page 8, line 4.

15 The invention of amended independent Claim 1 is a flexible support apparatus formed of a support base (14) having an opening (36) in one surface, a mounting bracket (16) having an opening (38) in one surface, and a permanently bendable continuously solid metal rod (12) having a first end (12a) installed in the opening (36) of the support base (14) and fused directly thereto with a weld joint formed directly between the first end (12a) of the metal rod (12) and the support base (14), and having a second end (12a) installed in the opening (38) of the mounting bracket (16) and fused directly thereto with a weld joint formed directly between the second end (12a) of the metal rod (12) and the mounting bracket (16).
20

The invention of dependent Claim 2 is the metal rod (12) of claim 1 being formed of a substantially constant diameter. See, e.g., Detailed Description Of Preferred Embodiment at page 6, lines 15-25; Figures 2, 3.

25 The invention of dependent Claim 3 is the openings (36, 38) in the support base (14) and mounting bracket (16) of claim 1 being formed of a second larger (40, 42) opening into which opposite ends (18a) of a flexible sheath (18) are inserted. See, e.g., Detailed Description Of Preferred Embodiment at page 7, lines 4-13; page 7, lines 22-25; Figures 3, 5.

30 The invention of dependent Claim 5 is the support base (14) and mounting bracket (16) of claim 1 each being formed of an ultrasonically weldable plastic material. See, e.g., Detailed Description Of Preferred Embodiment at page 6, lines 28-29; Figure 2.

The invention of dependent Claim 6 is the metal rod (12) of claim 5 being formed of a solid metal rod formed of a material selected from the group of materials comprising: aluminum, copper, and copper coated with another metal material. See, e.g., Detailed Description Of Preferred Embodiment at page 6, lines 15-25; Figures 2 and 3

5 The invention of dependent Claim 7 is the ends (12a) of the metal rod (12) of claim 6 being formed with an upset metal finish. See, e.g., Detailed Description Of Preferred Embodiment at page 6, line 26-page 7, line 3; Figures 2, 3.

The invention of dependent Claim 8 is the metal rod (12'), the support base (14') and the mounting bracket (16') of claim 7 each being formed of a material that is metal-to-metal weldable
10 by conventional means. See, e.g., Detailed Description Of Preferred Embodiment at page 8, lines 5-10; page 8, line 27-page 9, line 5; page 9, line 25-page 10, line 2; Figures 4 and 5.

The invention of amended independent Claim 9 is a flexible support apparatus (10) formed of a support base (14) having a substantially tubular aperture (36), a mounting bracket (16) having a substantially tubular aperture (38), and a permanently bendable continuously solid metal
15 rod (12) having a first end (12a) inserted into the tubular aperture (36) of the support base (14) and having a weld joint formed therebetween, and a second end (12a) inserted into the tubular aperture (38) of the mounting bracket (16) and having a weld joint formed therebetween. See, e.g., Detailed Description Of Preferred Embodiment at page 6, line 26-page 7, line 3; Figures 2, 3.

The invention of dependent Claim 10 is the support base (14) and mounting bracket(16) of
20 claim 9 both being formed of an ultrasonically weldable plastic material, and the weld joints formed between the metal rod (12) and each of the support base (14) and the mounting bracket (16) both further being formed as ultrasonic weld joints. See, e.g., Detailed Description Of Preferred Embodiment at page 7, lines 14-22; Figures 2, 3.

The invention of dependent Claim 11 is the ends of the metal rod (12) of claim 10 each
25 being formed of upset surface material. See, e.g., Detailed Description Of Preferred Embodiment at page 6, lines 26-28; Figures 2, 3.

The invention of dependent Claim 12 is the metal rod (12) of claim 11 being formed of a material selected from the group of materials comprising: aluminum, copper, and copper coated with zinc. See, e.g., Detailed Description Of Preferred Embodiment at page 6, lines 15-19;
30 Figures 2, 3.

The invention of dependent Claim 13 is the metal rod (12), support base (14) and mounting bracket (16) of claim 9 each being formed of aluminum. See, e.g., Detailed Description Of Preferred Embodiment at page 6, lines 17-18; Figures 2, 3.

5 The invention of dependent Claim 14 is the apparatus (10) of claim 9, further comprising a flexible plastic sheath (18) disposed around the metal rod (12) between the support base (14) and the mounting bracket (16). See, e.g., Detailed Description Of Preferred Embodiment at page 5, lines 9-12; Figures 1, 3, 5.

10 The invention of dependent Claim 15 is the support base (14) and the mounting bracket (16) of claim 14 each being formed with a respective counter-bore (40, 42) substantially concentric with the respective tubular aperture (36, 38) and sized to admit the flexible plastic sheath (18). See, e.g., Detailed Description Of Preferred Embodiment at page 7, lines 4-7; Figures 2, 3.

15 The invention of amended independent Claim 16 is a method for forming a flexible support apparatus (10, 10') by forming a support base (14, 14') having a tubular aperture (36, 36') therein, forming a mounting bracket (16, 16') having a tubular aperture (38, 38') therein, fusing a first end (12a, 12a') of a length of permanently bendable continuously solid metal rod (12, 12') in the tubular aperture (36, 36') of the support base (14, 14'), and fusing a second end (12a, 12a') of the length of permanently bendable continuously solid metal rod (12, 12') in the tubular aperture (38, 38') of the mounting bracket (16, 16'). See, e.g., Detailed Description Of Preferred
20 Embodiment at page 7, lines 14-28; page 8, line 27-page 9, line 24; Figures 2, 4.

25 The invention of dependent Claim 17 is the method of claim 16, further comprising forming a support base (14) further comprises molding a support base (14) of an ultrasonically weldable plastic material, forming a mounting bracket (16) further comprises molding a mounting bracket (16) of an ultrasonically weldable plastic material, and fusing first and second ends (12a) of the metal rod (12) in the respective tubular apertures (36) and (38) of the support base (14) and mounting bracket (16) further comprises ultrasonically welding the first and second ends (12a) of the metal rod (12) in the respective tubular apertures (36) and (38) of the (14) and mounting bracket (16). See, e.g., Detailed Description Of Preferred Embodiment at page 6, lines 28-29; page 7, lines 14-23; Figures 2, 3.

The invention of dependent Claim 18 is the method of claim 17, further comprising upsetting the metal around first and second ends (12a) of the metal rod (12) prior to welding. See, e.g., Detailed Description Of Preferred Embodiment at page 6, lines 26-28; Figures 2, 3.

5 The invention of dependent Claim 19 is the method of claim 18 wherein: forming a support base (14) having a tubular aperture (36) therein further includes forming a second tubular aperture (40) therein that is of larger diameter and is substantially concentric with a first tubular aperture (36) having the metal rod (12) welded therein; forming a mounting bracket (16) having a tubular aperture (38) therein further includes forming a second tubular aperture (42) therein that is of larger diameter and is substantially concentric with a first tubular aperture (38) having the
10 metal rod (12) fused therein; and further installing a flexible sheath (18) around the metal rod (12) by inserting opposite ends (18a) of the flexible sheath (18) into the respective second tubular apertures (40, 42). See, e.g., Detailed Description Of Preferred Embodiment at page 7, lines 14-25; Figures 2, 3.

The invention of dependent Claim 20 is the method of claim 16 wherein: forming a
15 support base (14') further includes forming a support base (14') of a weldable aluminum material; forming a mounting bracket (16') further includes forming a mounting bracket (16') of a weldable aluminum material; and further including forming the metal rod (12) of a weldable aluminum material. See, e.g., Detailed Description Of Preferred Embodiment at page 8, lines 5-10; Figures 4 and 5.

20 The invention of dependent Claim 21 is the method of claim 20, further including installing a flexible sheath (18) around the metal rod (12'). See, e.g., Detailed Description Of Preferred Embodiment at page 9, lines 6-12; Figures 4, 5.

(vi) GROUNDS OF REJECTION TO REVIEWED ON APPEAL

1) Claims 1-3, 5, 6, 8-10, 14, 15 and 16-19 are rejected under 35 USC § 103(a) as
25 being obvious over US Patent 6,749,160 to Richter in view of US Patent 4,020,575 to Kruger, et al.

2) Claim 13, 20 and 21 are rejected under 35 USC § 103(a) as being obvious over US Patent 6,749,160 to Richter and in view of US Patent 4,020,575 to Kruger, et al. as applied to claim 9 and further in view of US Patent 6,811,146 to Giralt.

3) Claims 7, 11 and 12 are rejected under 35 USC § 103(a) as being obvious over US Patent 6,749,160 to Richter in view of US Patent 4,020,575 to Kruger, et al., and further in view of US Patent 6,637,642 to Lingnau.

(vii) ARGUMENT

5 1) Rejection of Claims 1-3, 5, 6, 8-10, 14-16 and 17-19 under 35 U.S.C. § 103

Claims 1-3, 5, 6, 8-10, 14-16 and 17-19 are rejected under 35 USC § 103(a) as being obvious over US Patent 6,749,160 to Richter in view of US Patent 4,020,575 to Kruger, et al.

In the invention as presently claimed, a flexible support apparatus comprises: a support base having an opening in one surface; a mounting bracket having an opening in one surface; and
10 a permanently bendable continuously solid metal rod having a first end installed in the opening of the support base and fused directly thereto with a weld joint formed directly between the first end of the metal rod and the support base, and having a second end installed in the opening of the mounting bracket and fused directly thereto with a weld joint formed directly between the second end of the metal rod and the mounting bracket.

15 US Patent 6,749,160 to Richter teaches a support arm 10 consisting of an aluminum rod 12 covered by a corrugated flexible plastic tube 11. Annular plug members 12a and 12b are disposed on the aluminum rod 12 at the ends. The corrugated plastic tube 11 is supported by the annular plug members 12a and 12b at a given radial distance from the aluminum rod 12. Column 4, lines 24-32. One end of a support arm 10 is mounted in the end of the sleeve 5 remote from the suction
20 element 2. Column 4, lines 20-23. The support plate 13 is provided with a sleeve 14 in which the other end of the support arm 10 is received and firmly connected to the support plate 13. Column 4, lines 33-35.

US Patent 4,020,575 to Kruger, et al. teaches a badge formed of an envelope 12 having a front panel 14 with a major flap 16 and a minor flap 18. Column 1, line 63-column 2, line 5. The
25 front panel 14 with a major flap 16 and a minor flap 18 are all formed in a single sheet of acetate or similar transparent stiffly flexible plastic. Column 2, lines 6-8. A clamping panel 20, also of acetate or other flexible plastic, is secured flat against the flap 16. The clamping panel 20 is formed with a pair of spaced apertures 22 (FIG. 2) in a V-shaped slit 24. A safety-pin-like fastener 28 of wire is formed with a base run 30 opposite a pin run 36. A distal end of the tongue

38 of the V-shaped slit 24 is lifted up from the clamping panel 20 and is inserted between the base run 30 and the pin run 36 of the fastener so that the base run 30 is threaded into and out of the apertures 22 respectively in final assembly. Column 2, lines 9-30. "Thereafter, the clamping panel 20 is secured as by ultrasonic welding or the like, directly against the major flap 16. This is as shown in the hatched area S in FIG. 1. It is important that the sealed area include at least some of the tongue 38 so that the tongue may not thereafter lift up and permit the escape of the fastener 28, as will be understood." Column 2, lines 31-37. Trapping of the base run 30 of the fastener 28 between the clamping panel 20 and the flap 16 is "readily accomplished by the sealing process." The capture of the base run 30 through the apertures 22 "immobilizes the pin with the fastener 28." Once the pin run 36 is applied to the clothing, the envelope 12 is not readily given to pivoting about. This keeps the envelope and material therein well oriented. Column 2, lines 38-45.

The Office Action contends that Richter discloses a flexible support apparatus (10) having a support base (10) having an opening in one surface and a mounting bracket having an opening (13) in one surface and a permanently bendable continuously solid metal rod of substantially constant cross section, the rod being made of aluminum (12, See Col. 3 line 9 for rod material) having a first end installed in the opening of the support base and fused direction to the support base and having a second end installed in the opening of the mounting means and fused directly to the mounting bracket and wherein the opening in the support base and mounting bracket have a second larger opening (Inner and outer openings, referencing Drawing of Richter) into which a flexible sheath (11) is inserted.

The Office Action further contends that Richter teaches the method forming a support base, forming a mounting bracket and fusing a length of the rod to the tubular apertures of the base and the bracket, a flexible plastic sheath (11) disposed around the metal rod (12) between the support base and the mounting bracket and wherein the bracket and the base both have a respective counter-bore which is substantially concentric with the respective tubular aperture and sized to admit the flexible plastic sheath (11).

The Office Action admits that Richter does not teach that a welded/ultrasonically welded joint is formed directly between the first end of the metal rod and the support base and that the base or that the base and bracket are formed of ultrasonically weldable plastic.

The Office Action also admits that Richter does not teach the method of ultrasonically welding the plastic or metal to metal fusible by conventional means.

However, the Office Action contends that Richter does teach that there is a joint formed directly between the first end of the metal rod and the support base.

5 The Office Action further contends that Kruger et al. teaches a device with ultrasonically weldable plastic and the method of using ultrasonically weldable plastic used for securely bonding two elements together. Col. 1, line 37 and Col. 2, line 12.

The Office Action then contends that it would have been obvious to one having ordinary skill in the art at the time the invention was made from the teachings of Kruger et al. to have fused any pieces together either by welding or by using an ultrasonic weldable plastic in order to secure elements together, welding and weldable plastic both being well known in the art at the time of the invention.

10 The Office Action also contends that it would also be obvious to have had metal to metal fused, the choice of any suitable material being obvious.

Applicant respectfully disagreed.

Claim 1 is not made obvious by Richter. The Office Action contends that Richter teaches the method of “fusing a length of the rod to the tubular apertures of the base and the bracket.” However,
15 Richter provides no support for this contention.

Rather, Richter only teaches that “one end of a support arm 10 is mounted on the suction disc mounting arrangement” (column 4, lines 20-23 (emphasis added)); and the “end of the support arm 10 is received and firmly connected to the support plate 13” (column 4, lines 33-35 (emphasis added)). Richter’s descriptions as “mounted” and “firmly connected” both clearly fail to
20 disclose or suggest any sort of “fusing.” The applicant respectfully argued that “mounted” and “firmly connected” are not synonymous with the term “fused.” Thus, the terms “mounted” and “firmly connected” cannot disclose or suggest any sort of “fusing.” Accordingly, the applicant asserted that use of the claim term “fused” distinguishes from Richter.

Furthermore, the applicant asserted that Richter clearly fails to disclose or suggest a weld
25 joint between the first and second ends of the metal rod and the respective support base and mounting bracket, as recited in claim 1. Rather, as discussed above, Richter only teaches that “one end of a support arm 10 is mounted on the suction disc mounting arrangement” (column 4, lines 20-23); and that the “end of the support arm 10 is received and firmly connected to the support plate 13” (column 4, lines 33-35).

Furthermore, the applicant asserted that the aluminum rod 12 of Richter is not attached in any way to the respective sleeves 5 and 14. Rather, annular plug members 12a and 12b are only “disposed” in an unknown manner at opposite ends of the aluminum rod 12. See, e.g., Figure 2. *Only then* are the annular plug members 12a and 12b “received and firmly connected to the support plate 13.” See, e.g., column 4, lines 24-33 (reprinted below).

The support arm consists of a corrugated flexible plastic tube 11 through which an aluminum rod 12 extends in radially spaced relationship rod from the corrugated flexible plastic tube 11. At the opposite ends of the aluminum rod 12, annular plug members 12a and 12b are disposed on the aluminum rod 12 on which the corrugated plastic tube is supported at the given radial distance from the aluminum rod 12 and by which the aluminum rod 12 and the corrugated plastic tube 11 are fixed relative to each other. Column 4, lines 24-33 (emphasis added).

The support plate 13 is provided with a sleeve 14 in which the other end of the support arm 10 is “received and firmly connected” in an unknown manner to the support plate 13. Column 4, lines 33-35 (emphasis added).

The applicant asserted that Richter does not anywhere actually discuss connecting the plug member 12a to the sleeve 5. See, Richter generally.

Thus, the applicant asserted that Richter does not teach any way of connecting annular plug members 12a and 12b on the aluminum rod 12. Rather, the applicant asserted that Richter only teaches the plug members 12a and 12b being “disposed” on the rod 12 in an unknown manner.

The applicant respectfully argued that the term “disposed” is not synonymous with the term “fused.” Thus, the applicant asserted that the term “disposed” cannot disclose or suggest any sort of “fusing.” Accordingly, the applicant continued to assert that the claim term “fused” distinguishes from Richter. The Office Action’s contention that Richter teaches “the rod being made of aluminum (12, See Col. 3 line 9 for rod material) having a first end installed in the opening of the support base and fused direction to the support base and having a second end installed in the opening of the mounting means and fused directly to the mounting bracket,” clearly requires reading *far more* into the Richter patent than Richter teaches. This contention requires the use of impermissible hindsight.

Additionally, the description of Richter that the “annular plug members 12a and 12b are disposed on the aluminum rod 12” (Column 4, lines 33-35 (emphasis added)) cannot disclose or suggest the weld joint between the first and second ends of the metal rod and the respective support base and mounting bracket, as recited in claim 1.

5 The applicant respectfully argued that for at least the above reasons claim 1 is not made obvious by Richter.

 Furthermore, the applicant submits that Kruger fails to provide the deficiencies of Richter. Kruger fails to disclose or suggest a “weld joint formed directly between the first end of the metal rod and the support base,” and a “weld joint formed directly between the second end of the metal
10 rod and the mounting bracket,” as now recited in claim 1.

 Rather, the applicant asserted that Kruger only teaches welding the plastic clamping panel 20 to the major flap 16. See, e.g., column 2, lines 31-37. The base run 30 of the fastener 28 is only “captured” between the clamping panel 20 and the flap 16, which is “readily accomplished by the sealing process.” Column 2, lines 38-45. Thus, Kruger only teaches plastic-to-plastic welding
15 that captures the metal base run 30 of the fastener 28. Kruger fails to disclose or suggest any welding of the metal base run 30 of the fastener 28 to anything. Kruger only teaches welding plastic to plastic.

 Furthermore, Kruger requires the base run 30 to be “bent in the form of a sine wave” that “further immobilizes the fastener so that the pin run does not fold down against the back of the
20 badge which would make it awkward to attach to clothing.” Column 2, lines 46-52. This requirement to “further immobilizes the fastener” emphasizes that the metal base run 30 of the fastener 28 is not welded to either the clamping panel 20 or the flap 16. Instead, the base run 30 of the fastener 28 must be bent in to a sine wave to keep from rotating between the laminated clamping panel 20 and the flap 16.

25 Thus, the applicant asserted that Kruger fails to disclose or suggest a “weld joint” between first and second ends of the solid metal rod and the respective support base and mounting bracket, as recited in claim 1. Rather, the applicant asserted that by teaching the base run 30 of the fastener 28 merely being “captured” between by the sealed area between the clamping panel 20 or the flap 16, Kruger actually teaches away from the “metal rod having a first end fused directly to the
30 support base, and having a second end fused directly to a mounting bracket,” as recited in claim 1.

The applicant further asserted that Richter cannot be combined with Kruger at least because Richter teaches metal-to-metal connections, while Kruger only teaches welding plastic to plastic, which is clearly a completely different and unrelated process. Furthermore, there is no suggestion of teaching in either Richter or Kruger to combine plastic-to-plastic welding of Kruger
5 either with the annular plug members 12a and 12b being “disposed” at opposite ends of the aluminum rod 12, nor with the annular plug members 12a and 12b being “received and firmly connected” to the support plate 13, as taught by Richter.

The applicant asserted that a mere showing that a rod 12 can be supported in some way on a support plate 13, and that it is known to ultrasonic weld acetate to itself cannot possibly disclose
10 or suggest the present invention having a permanently bendable continuously solid metal rod having a first end installed in an opening of a support base and fused directly thereto with a weld joint formed directly between the first end of the metal rod and the support base, and having a second end installed in an opening of a mounting bracket and fused directly thereto with a weld joint formed directly between the second end of the metal rod and the mounting bracket, as
15 recited in claim 1. Rather, the applicant respectfully asserted that finding that such a combination teaches the present invention clearly required impermissible hindsight.

Additionally, the applicant respectfully asserted that the present invention accomplishes in only a few simply assembled parts the same functions as the far more complex Richter device, which is a clear indicia of nonobviousness. See, *In re Edge*, 359 F.2d 896, 149 USPQ 556 (CCPA
20 1966). The court found that the omission of an element and retention of its function is an indicia of unobviousness. (Claims at issue were directed to a printed sheet having a thin layer of erasable metal bonded directly to the sheet wherein said thin layer obscured the original print until removal by erasure. The prior art disclosed a similar printed sheet which further comprised an intermediate transparent and erasure-proof protecting layer which prevented erasure of the printing when the
25 top layer was erased. The claims were found unobvious over the prior art because the although the transparent layer of the prior art was eliminated, the function of the transparent layer was retained since appellant's metal layer could be erased without erasing the printed indicia.).

The applicant asserted that here the present invention couples the permanently bendable metal rod 12 directly to the support base 14 and mounting means 16. See, e.g., Figures 3 and 5.
30 The applicant asserted that, in contrast, Richter requires annular plug members 12a and 12b to be

disposed on the opposite ends of the aluminum rod 12, then the annular plug members 12a and 12b must be firmly connected to the sleeves 5 and 14. See, e.g., column 3, line 54-column 4, line 50; and Figure 2. Here, similarly to the printed sheet in *In re Edge*, the present invention accomplishes the flexible support apparatus 10 by making connections directly between the permanently bendable metal rod 12 and the support base 14 and mounting means 16 without the intervening annular plug members 12a and 12b required by Richter. Thus, the applicant asserted that here, the present invention omits the annular plug members 12a and 12b elements required in the prior art while retaining the function of connecting the rod 12 to the support base 14 and mounting means 16, which is a clear indicia of nonobviousness.

The applicant respectfully asserted that, for at least the above reasons, claim 1 is not made obvious by Richter and Kruger, even if they could be combined, which the applicant asserted they cannot.

The Prior Art Must Suggest The Desirability Of The Claimed Invention

"There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obvious was held improper.). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

"In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification." *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem

to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to the motivation to combine references); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 69 USPQ2d 1686 (Fed. Cir. 2004), the patent claimed underpinning a slumping building foundation using a screw anchor attached to the foundation by a metal bracket. One prior art reference taught a screw anchor with a concrete bracket, and a second prior art reference disclosed a pier anchor with a metal bracket. The court found motivation to combine the references to arrive at the claimed invention in the "nature of the problem to be solved" because each reference was directed "to precisely the same problem of underpinning slumping foundations." *Id.* at 1276, 69 USPQ2d at 1690. The court also *rejected* the notion that "an express written motivation to combine must appear in prior art references." *Id.* at 1276, 69 USPQ2d at 1690.

Here, in contrast to the screw anchor of *Ruiz v. A.B. Chance Co.*, applicant submits that neither Richter nor Kruger disclose or suggest forming a weld joint between the first and second ends of the metal rod and the respective support base and mounting bracket, as recited in Claim 1.

In *In re Kotzab*, the claims were drawn to an injection molding method using a single temperature sensor to control a plurality of flow control valves. The primary reference disclosed a multizone device having multiple sensors, each of which controlled an associated flow control valve, and also taught that one *system* may be used to control a number of valves. The court found that there was insufficient evidence to show that one *system* was the same as one *sensor*. While the control of multiple valves by a single sensor rather than by multiple sensors was a "technologically simple concept," there was no finding "as to the specific understanding or principle within the knowledge of the skilled artisan" that would have provided the motivation to use a single sensor as the system to control more than one valve. 217 F.3d at 1371, 55 USPQ2d at 1318.

Here, similarly to the examiner in *In re Kotzab*, the Office Action presented no showing "as to the specific understanding or principle within the knowledge of the skilled artisan" that

would have provided the motivation to substitute a “weld joint” known only to be used for plastic-to-plastic welding of a clamping panel 20 and flap 16 for capturing a metal base run 30 there between. See, Kruger at column 2, lines 38–45 (emphasis added).

5 In *In re Fine*, the claims were directed to a system for detecting and measuring minute quantities on nitrogen compounds comprising a gas chromatograph, a converter which converts nitrogen compounds into nitric oxide by combustion, and a nitric oxide detector. The primary reference disclosed a system for monitoring sulfur compounds comprising a chromatograph, combustion means, and a detector, and the secondary reference taught nitric oxide detectors. The examiner and Board asserted that it would have been within the skill of the art to substitute one
10 type of detector for another in the system of the primary reference, however the court found there was no support or explanation of this conclusion and reversed.

Here, similarly to the examiner in *In re Fine*, the Office Action presented no support or explanation for concluding that it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ plastic-to-plastic welding as taught by Kruger as the
15 method for making the end of the support arm 10 of Richter “received and firmly connected” to the support plate 13, except that it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious choice. Citing *In re Leshin*, 125 USPQ 416.

However, as discussed herein above, the court of *In re Leshin* required the container to be
20 a container of a type made of plastics prior to the invention in order to arrive at a holding of obviousness for the selection of a known plastic to make the container. Thus, the *Leshin* court required the container to be of a type made of plastics prior to the invention.

Here, in stark contrast to the container in *Leshin*, the welding of Kruger is limited to plastic-to-plastic welding that only “captures” base run 30 of the fastener 28 between the
25 clamping panel 20 and the flap 16. Therefore, the welding of Kruger is not of a type for metal-to-plastic welding, else the base run 30 would be “welded” instead of merely “captured.” It follows that selection of a welding process whereby a metal rod is “fused directly” to both a support base and a mounting bracket with a “weld joint formed directly between” the first and second ends of the metal rod and the support base and mounting bracket is not made obvious by a
30 plastic-to-plastic welding process for “capturing” a metal rod between plastic sheets welded to

one another. The process here is a “weld joint formed directly between” a metal rod and two other parts: a support base and a mounting bracket which clearly makes the “plastic-to-plastic” welding substitution a non-obvious selection for the “firmly connected” support arm 10 of Richter.

Additionally, the court in *Sinclair & Carroll Co. v. Interchemical Corp.* found the selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness determination. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). Here, in contrast to the solvent in *Sinclair*, the “welding” of Kruger is known only to be suitable for the intended purpose of plastic-to-plastic lamination. Nothing of Kruger discloses or suggests welding metal, else the base run 30 would be “welded” instead of merely “captured.”

In *In re Jones*, the claimed invention was the 2-(2 ϕ -aminoethoxy) ethanol salt of dicamba, a compound with herbicidal activity. The primary reference disclosed *inter alia* the substituted ammonium salts of dicamba as herbicides, however the reference did not specifically teach the claimed salt. Secondary references teaching the amine portion of the salt were directed to shampoo additives and a byproduct of the production of morpholine. The court found there was no suggestion to combine these references to arrive at the claimed invention.

Here, the claimed invention is a “weld joint formed directly between” respective ends of a metal rod and the support base and mounting bracket. The primary reference, Richter, discloses annular plug members 12a and 12b of unknown material “disposed” on the opposite ends of the aluminum rod 12, then the annular plug members 12a and 12b must be “firmly connected” to the sleeves 5 and 14. See, e.g., column 3, line 54-column 4, line 50; and Figure 2. The secondary reference, Kruger, teaches plastic-plastic welding used to “capture” a base run 30 of a wire safety-pin-like fastener 28. Similarly to the finding of the court of *In re Jones*, there is no suggestion here to combine these references to arrive at the claimed invention.

Fact That References Can Be Combined Or Modified Is Not Sufficient To Establish Prima Facie Obviousness

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990) (Claims were directed to an apparatus for

producing an aerated cementitious composition by drawing air into the cementitious composition by driving the output pump at a capacity greater than the feed rate. The prior art reference taught that the feed means can be run at a variable speed, however the court found that this does not require that the output pump be run at the claimed speed so that air is drawn into the mixing chamber and is entrained in the ingredients during operation. Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." 916 F.2d at 682, 16 USPQ2d at 1432.). See also *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992) (flexible landscape edging device which is conformable to a ground surface of varying slope not suggested by combination of prior art references).

Here, similar to the feed means in *Mills*, although a prior art "weld joint" for plastic-to-plastic welding of Kruger may be capable of being modified to substitute for the "firmly connected" support arm 10 of Richter, there must be a suggestion or motivation in the reference to do so. At least because Kruger only teaches a "weld joint" for plastic-to-plastic welding, while Richter fails to disclose or suggest any plastic for the annular plug members 12a and 12b or respective the sleeves 5 and 14, there is no suggestion or motivation in the reference to substitute the plastic-to-plastic welding of Kruger to "firmly connected" the support arm 10 of Richter.

Furthermore, even if there was a suggestion or motivation to combine the references, which there is not, such a combination would only result in the annular plug members 12a and 12b being "captured" in the respective the sleeves 5 and 14. Kruger does not disclose or suggest the base run 30 of the fastener 28 being welded or fused directly to the clamping panel 20 or the flap 16, but rather merely being "captured" between by the sealed area there between. Column 1, line 63-column 2, line 45. Thus, the "weld joint" is only between the clamping panel 20 and flap 16, and does not involve the base run 30 of the fastener 28. So, combining the "weld joint" of Kruger with the "firmly connected" of Richter only results in the annular plug members 12a and 12b being "captured," but does not result in their being fused directly to the respective the sleeves 5 and 14.

Thus, the combination of Kruger with Richter does not make obvious the present invention as recited in claim 1 wherein "a permanently bendable continuously solid metal rod having a first end installed in the opening of the support base and fused directly thereto with a weld joint formed directly between the first end of the metal rod and the support base, and having a second

end installed in the opening of the mounting bracket and fused directly thereto with a weld joint formed directly between the second end of the metal rod and the mounting bracket."

Fact That The Claimed Invention Is Within The Capabilities Of One Of Ordinary Skill In The Art Is Not Sufficient By Itself To Establish Prima Facie Obviousness

5 A statement that modifications of the prior art to meet the claimed invention would have been " 'well within the ordinary skill of the art at the time the claimed invention was made' " because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 10 1300 (Bd. Pat. App. & Inter. 1993). See also *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000) (Court reversed obviousness rejection involving technologically simple concept because there was no finding as to the principle or specific understanding within the knowledge of a skilled artisan that would have motivated the skilled artisan to make the claimed invention); *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 15 1999) (The level of skill in the art cannot be relied upon to provide the suggestion to combine references.).

 Here, similarly to the obviousness rejection in *Ex parte Levengood*, the mere statement that "it would have been obvious to one having ordinary skill in the art at the time the invention was made ... to have fused any pieces together either by welding or by using an ultrasonic weldable plastic 20 in order to secure elements together" because the references relied upon were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references.

 The Office Action mailed February 27, 2007, offered the following rebuttal arguments of 25 the applicant's arguments filed January 4, 2007.

1) Applicant argued that the term "fused" is not met by the term "firmly connected."

 In response to applicant's argument that the term "fused" is not met by the term "firmly connected," the Office Action contends that it is evident that the joint as taught by Richter is

intended to be firmly secured and "welding" or "fusing" is an obvious way to connect a joint, the process, method and structure of which was well known at the time of the invention. The applicant's structure has not become novel because one of its joints is "welded, ultrasonically welded or fused". In effect, the Office Action contends that, if the prior art structure is capable of performing the intended use, then it meets the claim.

In rebuttal, the applicant submits that the term "firmly connected" is so broad that it cannot be construed to disclose or suggest a joint that is "welded, ultrasonically welded or fused." Rather, the intervention both of annular plug members 12a and 12b and sleeves 5 and 14 between the ends of the aluminum rod 12 and the respective suction element 2 and support plate 13 teach away from a joint that is "welded, ultrasonically welded or fused."

2) Applicant argued that Richter does not teach that the aluminum rod is connected to the support plate.

In response to applicant's argument that Richter does not teach that the aluminum rod is connected to the support plate, the Office Action contends that the applicant has narrowly interpreted the term "connected" to mean something it does not. The Office Action further contends that the aluminum rod is clearly connected to the plate, even if there are other elements in between, aiding in this connection.

In response to applicant's argument that Kruger fails to teach a weld joint formed directly between the first end of the metal rod and the support base, the Office Action contends that securing two elements together with a weld joint is not new, but an obvious way to attach the desired device.

In response to applicant's argument that the Kruger reference teaches away from the being the metal rod having a first end fused directly to the support base because Richter teaches metal to metal welding and Kruger teaches plastic to plastic, the Office Action contends that this argument is unpersuasive. The Office Action contends that Kruger is used to demonstrate that ultrasonic welding is not novel and the material welded is inconsequential in this teaching.

In rebuttal, the applicant points out that the Office Action actually acknowledges that Richter teaches "other elements in between" the aluminum rod and the respective suction element 2 and support plate 13 for "aiding in this connection." As discussed above, the intervening annular plug members 12a and 12b and sleeves 5 and 14 between the ends of the aluminum rod 12 and the

respective suction element 2 and support plate 13 teach away from a joint that is "welded, ultrasonically welded or fused."

In further rebuttal, the applicant reiterates that, in *In re Mills*, the court found that the mere fact that references can be combined or modified does not render the resultant combination
5 obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Here, just because a rod can be "fused directly" with a weld joint formed directly between the metal rod and the respective support base and mounting bracket, does not render the combination obvious unless the prior art also suggests the desirability of the combination.

10 Here, instead of suggesting the desirability of the combination, Richter appears to teach away from a joint that is "welded, ultrasonically welded or fused" by adding multiple intervening elements in between.

Additionally, the applicant respectfully argues that the present invention accomplishes in only a few simply assembled parts the same functions as the far more complex Richter device,
15 which is a clear indicia of nonobviousness. See, *In re Edge*, 359 F.2d 896, 149 USPQ 556 (CCPA 1966). Here, the present invention omits the intervening annular plug members 12a and 12b and sleeves 5 and 14 between the ends of the aluminum rod 12 and the respective suction element 2 and support plate 13. However, the present invention retains their function of connecting the rod to the support base and mounting bracket, without the "other in elements in between, aiding in this
20 connection," as admitted by the Office Action. The court in *In re Edge* found that the omission of an element and retention of its function is an indicia of unobviousness.

3) Applicant argued that the conclusion of obviousness is based upon improper hindsight reasoning.

In response to applicant's argument that the conclusion of obviousness is based upon improper
25 hindsight reasoning, the Office Action contends that it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. The Office Action further contends that so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*,
30 443 F.2d 1392, 170 USPQ 209 (CePA 1971). The Office Action further contends that in this case,

welding, ultrasonic welding are all within the knowledge generally known at the time the application was filed and therefore cannot be considered hindsight reasoning.

In rebuttal, the applicant submits that substitution of known direct fusing, welding, or ultrasonic welding techniques for the end of the support arm 10 of Richter "being received and
5 firmly connected" to the support plate 13 requires extreme modification of the support arm 10. As discussed above, the Office Action actually acknowledges that Richter teaches "other in elements in between" the aluminum rod and the respective suction element 2 and support plate 13 for "aiding in this connection." These intervening annular plug members 12a and 12b and sleeves 5 and 14 between the ends of the aluminum rod 12 and the respective suction element 2 and support plate
10 13 must be removed from the support arm 10 before it can be "fused directly thereto with a weld joint formed directly between," as recited in claim 1 of the present invention. This extreme modification of Richter required for substitution of known direct fusing, welding, or ultrasonic welding techniques argues persuasively that the conclusion of obviousness clearly must be based upon improper hindsight reasoning.

15 Improper hindsight reasoning is clearly used here because the extra intervening elements of Richter clearly teach away from substitution of a joint that is "welded, ultrasonically welded or fused."

For at least the above reasons, the invention recited claim 1 as amended is believed to be
20 clearly allowable over Richter and Kruger.

Claims 2, 3 and 5, 6 and 8 are all believed to be allowable at least as depend from allowable base claim 1.

Claim 5 is believed to be further allowable independently of allowable claims 1, 2 and 3 as reciting each of the support base and the mounting bracket are formed of an ultrasonically
25 weldable plastic material. Claim 5 differs in scope from allowable claim 1. However, the above arguments and reasons for allowance directed to claim 4 are sufficiently applicable to claim 5 as to make repetition unnecessary. As discussed above, Richter teaches metal connections to undisclosed materials, while Kruger only teaches welding plastic-to-plastic. Thus, for each of the reasons above, claim 5 is believed to be allowable independently of allowable base claim 1.

Claim 8 is believed to be further allowable independently of allowable claims 1, 2 and 3 as reciting “each of the metal rod, the support base and the mounting bracket are formed of a material that is metal-to-metal weldable by conventional means.”

5 In contrast, as discussed herein above, Richter fails to disclose or suggest the aluminum rod 12 being “fused” to the sleeve 14 of the support plate 13. Richter further fails to disclose or suggest the aluminum rod 12 being “directly” connected to the sleeve 14 of the support plate 13. Rather, Richter only teaches the annular plug members 12a and 12b being “disposed” in an unknown manner to the aluminum rod 12, and then in turn being “firmly connected” in an unknown manner to the support plate 13. Richter does not disclose the material of the connected
10 elements.

Kruger fails to provide the deficiencies of Richter at least as to “each of the metal rod, the support base and the mounting bracket are formed of a material that is metal-to-metal fusible by conventional means,” as recited in claim 8. Rather, Kruger only teaches a major flap 16 formed of a sheet of acetate or similar transparent stiffly flexible plastic (column 2, lines 6-8) and a clamping
15 panel 20, also of acetate or other flexible plastic (column 2, lines 9-30), which is secured flat against the flap 16 by “ultrasonic welding or the like” (column 2, lines 31-37).

Thus, at least because Kruger only teaches welding of “acetate or similar transparent stiffly flexible plastic,” Kruger clearly fails to disclose or suggest any members being “formed of a material that is metal-to-metal fusible by conventional means,” as recited in claim 8.

20 For at least the above reasons, claim 8 is not made obvious by Richter and Kruger, and is believed to be allowable independently of allowable claims 2 and 3 and allowable base claim 1.

Claim 9 differs in scope from allowable claim 1. However, the above arguments directed to allowable claim 1 are sufficiently applicable to claim 9 as to make repetition unnecessary. Thus,
25 for each of the reasons above, claim 9 is believed to be allowable over the cited art.

Claims 10, 14 and 15 are believed to be allowable at least as depending from allowable independent base claim 9.

Claim 10 is believed to be further allowable independently of allowable base claim 9 as reciting “the weld joints formed between the metal rod and each of the support base and the mounting bracket further comprise ultrasonic weld joints.”

As discussed herein above regarding claim 1, Richter only teaches the annular plug members 12a and 12b being “disposed” in an unknown manner on the respective ends of the aluminum rod 12, with the annular plug members 12a and 12b then being “firmly connected” in an unknown manner to the support plate 13. See, e.g., Figure 2. Thus, Richter does not disclose or suggest weld joints formed between the metal rod and each of the support base and the mounting bracket,” as recited in claim 10.

Also, Kruger only teaches the plastic clamping panel 20 being “welded” to the flap 16. As taught by Kruger, the metal base run 30 of the metal fastener 28 is not welded to either the clamping panel 20 or the flap 16.

Thus, Kruger fails to provide the deficiencies of Richter as to “the weld joints formed between the metal rod and each of the support base and the mounting bracket further comprise ultrasonic weld joints,” as recited in claim 10.

For at least the above reasons, claim 10 is not made obvious by Richter and Kruger, and is believed to be allowable independently of allowable base claim 9.

Claim 15 is believed to be further allowable independently of allowable base claim 9 as reciting “each of the support base and the mounting bracket further comprises a respective counter-bore substantially concentric with the respective tubular aperture and sized to admit the flexible plastic sheath.”

As discussed herein above, in Figure 2 Richter clearly teaches that such “counter-bore” is not anticipated. Rather, in Figure 2 Richter clearly shows that the “sleeve 14” is a constant inner diameter from the opening to the floor to receive the annular plug member 12b. Rather, the annular plug member 12b is stepped with a first larger diameter to mate with the “sleeve 14,” and a second smaller diameter to mate with the corrugated plastic tube 11. Similarly, the “sleeve 5” is formed having a constant diameter from the opening to the floor to receive the annular plug member 12a. The annular plug member 12a is similarly stepped with a first larger diameter to

mate with the “sleeve 5,” and a second smaller diameter to mate with the corrugated plastic tube 11.

Thus, Richter even teaches away from the opening having a “counter-bore substantially concentric with the respective tubular aperture and sized to admit the flexible plastic sheath,” as recited in claim 15.

Kruger obviously fails to provide the deficiencies of Richter as to the “counter-bore” at least because Kruger only teaches the envelope 12 having a flat front panel 14 with flat major and minor flaps 16 and 18 all formed in a single sheet of acetate or similar transparent stiffly flexible plastic (column 2, lines 6-8), and flat clamping panel 20 also formed in a sheet of acetate or other flexible plastic (column 2, lines 9-30).

For at least the above reasons, claim 15 is believed to be allowable independently of allowable claim 14 and allowable base claim 9.

Claim 16 differs in scope from allowable claim 1. However, the above arguments and reasons for allowance directed to allowable claim 1 are sufficiently applicable to claim 16 as to make repetition unnecessary. Thus, for each of the reasons above, claim 16 is believed to be allowable.

Claims 17-19 are believed to be allowable at least as depending from allowable base claim 16.

Claim 17 is believed to be further allowable independently of allowable base claim 16 as reciting “ultrasonically welding the first and second ends of the metal rod in the respective tubular apertures of the support base and mounting bracket.”

Claim 17 differs in scope from allowable claim 5 as discussed herein above. However, the above arguments and reasons for allowance directed to claim 5 are sufficiently applicable to claim 17 as to make repetition unnecessary. Thus, for each of the reasons above, claim 17 is believed to be allowable independently of allowable base claim 16.

As discussed herein above regarding claim 5, Richter only teaches the annular plug members 12a and 12b being “disposed” in an unknown manner to the aluminum rod 12, and then in turn being “firmly connected” in an unknown manner to the support plate 13. See, e.g., Figure

2. Thus, Richter fails to disclose or suggest “ultrasonically welding the first and second ends of the metal rod in the respective tubular apertures of the support base and mounting bracket,” as recited in claim 17.

Also, Kruger only teaches the plastic clamping panel 20 being “welded” to the flap 16. As
5 taught by Kruger, the metal base run 30 of the fastener 28 is not welded to either the clamping panel 20 or the flap 16.

Thus, Kruger fails to provide the deficiencies of Richter as to “ultrasonically welding the first and second ends of the metal rod in the respective tubular apertures of the support base and mounting bracket,” as recited in claim 17.

10 For at least the above reasons, claim 17 is not made obvious by Richter and Kruger, and is believed to be allowable independently of allowable base claim 16.

Claim 18 is believed to be further allowable independently of allowable intervening claim 17 and allowable base claim 16 as reciting “upsetting the metal around first and second ends of the metal rod.” In contrast, Richter provides absolutely no teaching as to conditioning the end of the
15 aluminum rod 12. Rather, Richter only teaches “disposing” the annular plug members 12a and 12b onto the aluminum rod 12. Thus, Richter clearly cannot disclose or suggest “upsetting the metal,” as reciting in claim 18.

Kruger cannot provide the deficiencies of Richter at least because Kruger also provides absolutely no teaching as to conditioning the fastener 28 except the base run 30 being “bent in the
20 form of a sine wave.” Thus, Kruger also clearly cannot disclose or suggest “upsetting the metal,” as reciting in claim 18.

For at least the above reasons, claim 18 is not made obvious by Richter and Kruger, and is believed to be allowable independently of allowable intervening claim 17 and allowable base claim 16.

Claim 19 is further allowable independently of allowable intervening claims 17 and 18 and
25 allowable base claim 16 as reciting “forming a second tubular aperture therein that is of larger diameter and is substantially concentric with a first tubular aperture having the metal rod fused therein” as to both the support base and the mounting bracket.

As discussed herein above, Richter only teaches the support plate 13 having a “sleeve 14” having a constant inner diameter from the opening to the floor to receive the annular plug member

12b. Instead, Richer teaches the annular plug member 12b being stepped with a first larger diameter to mate with the "sleeve 14," and a second smaller diameter to mate with the corrugated plastic tube 11.

5 Kruger cannot provide the deficiencies of Richter at least because Kruger also provides absolutely no teaching as to any tubular aperture. Rather, Kruger only teaches a pair of apertures 22 for the fastener 28. Thus, Kruger also clearly cannot disclose or suggest "forming a second tubular aperture therein that is of larger diameter and is substantially concentric with a first tubular aperture having the metal rod fused therein," as recited in claim 19.

10 For at least the above reasons, claim 19 is not made obvious by Richter and Kruger, and is believed to be allowable independently of allowable intervening claims 17 and 18, and allowable base claim 16.

2) Rejection of Claim 10 under 35 U.S.C. § 103

15 Claims 13, 20 and 21 are rejected under 35 USC § 103(a) as being obvious over US Patent 6,749,160 to Richter and in view of US Patent 4,020,575 to Kruger, et al. as applied to claim 9 and further in view of US Patent 6,811,146 to Giralt.

Claim 13 is believed to be allowable at least as depending from allowable base claim 9.

Claims 20 and 21 are believed to be allowable at least as depending from allowable base claim 16.

20 The Office Action contends that Richter and Kruger et al. teach the basic inventive concept, including the method of installing a flexible sheath (10) around a solid metal rod (16).

The Office Action admits, and the applicant agrees, that Richter and Kruger et al. do not teach that the support base and mounting bracket are made of aluminum or the method of forming a support base and mounting bracket of weldable aluminum material.

25 The Office Action contends, however, that Giralt teaches an aluminum that is weldable material, referencing column 4, lines 39-41. The Office Action then contends that it would have been obvious to one having ordinary skill in the art at the time the invention was made from the teachings of

Giralt to have made the device and its parts of any suitable material or method of forming them from any suitable material, in order to easily attach the components to each other.

Applicant respectfully disagreed.

Applicant respectfully submitted that Giralt cannot provide the deficiencies of Richter and Kruger. Rather, Giralt merely teaches a aluminum that is weldable material. See, e.g., column 4, lines 39-41. However, Giralt fails to disclose or suggest the flexible support apparatus having a permanently bendable continuously solid metal rod having a first end inserted into a tubular aperture of a support base and having a weld joint formed therebetween, and a second end inserted into a tubular aperture of a mounting bracket and having a weld joint formed therebetween, as recited in base claim 9.

For at least the above reasons base claim 9 is not made obvious by the combination of Giralt with Richter and Kruger, and claim 9 is believed to be allowable.

Claim 16 differs in scope from allowable claim 9. However, the above arguments and reasons for allowance directed to claim 9 are sufficiently applicable to claim 16 as to make repetition unnecessary. Thus, for each of the reasons above, base claim 16 is believed to be allowable.

3) Rejection of Claims 15-18 under 35 U.S.C. § 103

Claims 7, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 6749160 to Richter and in view of United States Patent No. 4020575 to Kruger et al. as applied to claim 10 above and further in view of United Sates Patent No. 6637642 to Lingnau.

Claim 7 is believed to be allowable at least as depending from allowable base claim 1.

Claims 11 and 12 are believed to be allowable at least as depending from allowable base claim 9.

The Office Action contends that Richter and Kruger et al. and show the basic inventive concept.

The Office Action admits, and the applicant agrees, that Richter and Kruger et al. do not teach that the metal rod is made of upset metal finish prior to welding or an upset surface material or the method of upsetting the metal around the rod.

5 The Office Action contends, however, that Lingnau discloses solid state welding including teaching that the upset finish prior to welding of the metal can and will affect the welding profile. Referencing column 8, lines 6-24.

The Office Action then contends that it would have been obvious to make the metal tubing with an upset finish on the surface, in order to further change the welding characteristics of the metal rod.

10 Applicant respectfully disagreed.

As discussed herein above, the combination of Richter and Kruger clearly fail to show the basic inventive concept of base claims 1 and 9. The examiner admits, and the applicant agrees, that Richter and Kruger fail to disclose or suggest the metal rod having an upset metal finish prior to welding, or an upset surface material, or the method of upsetting the metal around the rod.

15 Therefore, any teaching by Lingnau of welding including teaching that the upset finish prior to welding is not effective to provide the deficiencies of Richter and Kruger. Therefore, for each of the reasons above, base claims 1 and 9 are believed to be allowable.

Claim 7 depends from base claim 1 which is not made obvious by Richter, as discussed above. As also discussed above, Kruger fails to provide the deficiencies of Richter.

20 Additionally, Lingnau fails to provide the deficiencies of both Richter and Kruger as to claim 7. Contrary to the examiner's belief, Lingnau fails to disclose or suggest the "upset metal finish" of the first and second ends of the metal rod, as recited in claim 7.

25 Rather, Lingnau only teaches a solid state welding process that combines the processes of induction welding and friction welding. Column 5, lines 15-18 ("The improved solid state welding process of this invention advantageously combines the processes of induction welding and friction welding to create a new solid state welding process which is superior to both of these processes.")

Thus, Lingnau does not even discuss the ultrasonic welding process of the present invention between a metal rod and an ultrasonically weldable plastic material, as discussed in claim 5.

Furthermore, the cited portion of Lingnau: column 8, lines 6-24 (reproduced herein below), recites only choice of a shielding gas, and induction coil features:

Although the most logical choice of a shielding gas is argon, experimentation has shown that argon causes arcing near the end of the heating cycle presumably due to the combined effects of the electric field from the coil and the infrared radiation from the faying surfaces. It has been found that nitrogen as a shielding gas eliminates arcing. Arcing may also be prevented by coating the induction coil with a high dielectric strength electrical insulator. It is critical that the induction coil be carefully designed to develop a uniform induced current density across the faying surfaces. Experimentation has shown that the geometry of the flash upset and the finish weld profile are strongly affected by the dimensions of the coil relative to the tube dimensions as discussed more fully herein below. As set forth above, however, the overall form of the flash upset is completely different from that produced by conventional frictional welding and the flash is substantially reduced by the solid state welding method of this invention. Column 8, lines 6-24 (emphasis added).

The only reference to “upset” in the above portion of Lingnau cited in the Office Action uses the term “upset” only in describing the overall form of the “flash upset.” Column 8, lines 19-24 (reproduce above). As taught by Lingnau, the “flash upset” is only the “volume of ejected metal” at the weld due to the direct energy input of induction heating the surfaces to be welded. See, e.g., column 4, lines 60-66, which is reproduced herein below:

As set forth below, the improved solid state welding process of this invention results in a much smaller volume of ejected metal commonly known as “flash” or “upset” by virtue of the direct energy input of induction heating the surfaces to be welded which conventionally must be generated by friction heating of the rubbing surfaces. Column 4, lines 60-66 (emphasis added).

Thus, Lingnau clearly does not disclose or suggest any “upset metal finish” of the first and second ends of the metal rod for welding directly to the support base and the mounting bracket, as recited in claim 7.

The Office Action contention that Lingnau discloses solid state welding including teaching that the upset finish prior to welding of the metal can and will affect the welding profile is not supported by the reference. Rather, as pointed out above and in earlier responses to previous Office Actions, the passage at column 8, lines 6-24 only describes the overall form of the “flash upset” produced by frictional welding processes. “Flash upset” has absolutely nothing to do with “upset metal finish,” as recited in claim 7.

For at least the above reasons, claim 7 is believed to be allowable over Richter in view of both Kruger and Lingnau.

Claims 11 and 12 depend from base claim 9 which is not made obvious by Richter, as discussed above. As also discussed above, Kruger fails to provide the deficiencies of Richter.

Claim 11 differs in scope from allowable claim 7. However, the above arguments directed to claim 7 are sufficiently applicable to claim 11 as to make repetition unnecessary. Thus, for each of the reasons above, claim 11 is believed to be allowable.

Claim 12 is allowable at least as depending from allowable intervening claim 11 and allowable base claim 9.

(viii) APPENDIX OF CLAIMS INVOLVED IN THE APPEAL

An APPENDIX OF CLAIMS INVOLVED IN THE APPEAL under 37 C.F.R. § 41.37(c)(viii) is attached containing a copy of the claims involved in the appeal.

(ix) APPENDIX OF EVIDENCE RELIED UPON BY APPELLANT IN THE APPEAL

An APPENDIX OF EVIDENCE under 37 C.F.R. § 41.37(c)(ix) of evidence submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132 or any other evidence entered by the Examiner and relied upon by appellant in the pending appeal is contained herein.

However, said APPENDIX OF EVIDENCE does not contain copies of evidence because no such evidence are known to appellant, the appellant’s legal representative, or assignee of which there is none.

(x) APPENDIX OF RELATED PROCEEDINGS

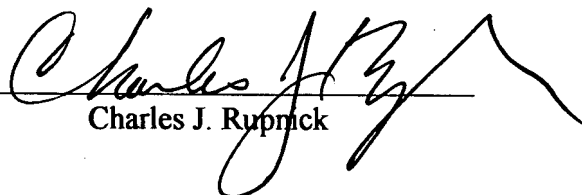
A RELATED PROCEEDINGS APPENDIX under 37 C.F.R. § 41.37(c)(x) is attached containing copies of any other appeals or interferences are known to either appellant or the appellant's legal representative which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

However, said RELATED PROCEEDINGS APPENDIX does not contain any copies of any other appeals or interferences because no such other appeals or interferences are known to appellant, the appellant's legal representative, or assignee of which there is none.

The claims being in form for allowance, consideration and allowance is respectfully requested. If the Board of Patent Appeals and Interferences has questions or wishes to discuss any aspect of the case, the Board is encouraged to contact the undersigned at the telephone number given below.

Respectfully submitted,

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APPENDIX OF CLAIMS INVOLVED IN THE APPEAL

Claim 1: A flexible support apparatus comprising:

- a support base having an opening in one surface;
- a mounting bracket having an opening in one surface; and

5 a permanently bendable continuously solid metal rod having a first end installed in the opening of the support base and fused directly thereto with a weld joint formed directly between the first end of the metal rod and the support base, and having a second end installed in the opening of the mounting bracket and fused directly thereto with a weld joint formed directly between the second end of the metal rod and the mounting bracket.

10 Claim 2: The apparatus of claim 1 wherein the metal rod is of substantially constant diameter between the first and second ends thereof.

Claim 3: The apparatus of claim 2 wherein each of the opening in the support base and the opening in the mounting bracket further comprises a second larger opening into which opposite ends of the flexible sheath are inserted.

15 Claim 4 (cancelled)

Claim 5: The apparatus of claim 3 wherein each of the support base and the mounting bracket are formed of an ultrasonically weldable plastic material.

20 Claim 6: The apparatus of claim 5 wherein the metal rod further comprises a solid metal rod formed of a material selected from the group of materials comprising: aluminum, copper, and copper coated with another metal material.

Claim 7: The apparatus of claim 6 wherein the first and second ends of the metal rod further comprise an upset metal finish.

Claim 8: The apparatus of claim 3 wherein each of the metal rod, the support base and the mounting bracket are formed of a material that is metal-to-metal weldable by conventional means.

Claim 9: A flexible support apparatus for supporting heavy objects relative to a fixed surface, the flexible support apparatus comprising:

- a support base having a substantially tubular aperture;
- a mounting bracket having a substantially tubular aperture; and

5 a permanently bendable continuously solid metal rod having a first end inserted into the tubular aperture of the support base and having a weld joint formed therebetween, and a second end inserted into the tubular aperture of the mounting bracket and having a weld joint formed therebetween.

10 Claim 10: The apparatus of claim 9 wherein the support base and mounting bracket are both formed of an ultrasonically weldable plastic material, and the weld joints formed between the metal rod and each of the support base and the mounting bracket further comprise ultrasonic weld joints.

Claim 11: The apparatus of claim 10 wherein the first and second ends of the metal rod further comprise upset surface material.

15 Claim 12: The apparatus of claim 11 wherein the metal rod further comprise a metal rod formed of a material selected from the group of materials comprising: aluminum, copper, and copper coated with zinc.

Claim 13: The apparatus of claim 9 wherein the metal rod, support base and mounting bracket are formed of aluminum.

20 Claim 14: The apparatus of claim 9, further comprising a flexible plastic sheath disposed around the metal rod between the support base and the mounting bracket.

Claim 15: The apparatus of claim 14 wherein each of the support base and the mounting bracket further comprises a respective counter-bore substantially concentric with the respective tubular aperture and sized to admit the flexible plastic sheath.

25 Claim 16: A method for forming a flexible support apparatus, the method comprising:
 forming a support base having a tubular aperture therein;

forming a mounting bracket having a tubular aperture therein;
fusing a first end of a length of permanently bendable continuously solid metal rod in the
tubular aperture of the support base; and
fusing a second end of the length of permanently bendable continuously solid metal rod in
5 the tubular aperture of the mounting bracket.

Claim 17: The method of claim 16 wherein:

forming a support base further comprises molding a support base of an ultrasonically
weldable plastic material;

forming a mounting bracket further comprises molding a mounting bracket of an
10 ultrasonically weldable plastic material; and

fusing first and second ends of the metal rod in the respective tubular apertures of the
support base and mounting bracket further comprises ultrasonically welding the first and second
ends of the metal rod in the respective tubular apertures of the support base and mounting
bracket.

15 Claim 18: The method of claim 17, further comprising upsetting the metal around first and second
ends of the metal rod prior to welding.

Claim 19: The method of claim 18 wherein:

forming a support base having a tubular aperture therein further comprises forming a
second tubular aperture therein that is of larger diameter and is substantially concentric with a first
20 tubular aperture having the metal rod welded therein;

forming a mounting bracket having a tubular aperture therein further comprises forming a
second tubular aperture therein that is of larger diameter and is substantially concentric with a first
tubular aperture having the metal rod fused therein; and

installing a flexible sheath around the metal rod by inserting opposite ends of the flexible
25 sheath into the respective second tubular apertures.

Claim 20: The method of claim 16 wherein:

forming a support base further comprises forming a support base of a weldable aluminum
material;

forming a mounting bracket further comprises forming a mounting bracket of a weldable aluminum material; and

further comprising forming the metal rod of a weldable aluminum material.

Claim 21: The method of claim 20, further comprising installing a flexible sheath around the metal

5 rod.

APPENDIX OF EVIDENCE RELIED UPON BY APPELLANT IN THE APPEAL

5 No evidence submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132 nor any other evidence entered by the Examiner and relied upon by appellant in the pending appeal are known to appellant, the appellant's legal representative, or assignee. Therefore, there being no such evidence, this APPENDIX OF EVIDENCE under 37 C.F.R. § 41.37(c)(x) does not contain any copies of such evidence, nor a statement setting forth where in the record that the evidence was entered in the record by the Examiner.

APPENDIX OF RELATED PROCEEDINGS

No copies of any other appeals or interferences are known to either appellant or the appellant's legal representative which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal are known to appellant, the appellant's legal representative, or assignee of which there is none. Therefore, there being no such other appeals or interferences, this APPENDIX OF RELATED PROCEEDINGS under 37 C.F.R. § 41.37(c)(ix) does not contain any copies of such evidence, nor a statement setting forth where in the record that the evidence was entered in the record by the Examiner.

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